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This review provides a broad overview of the studies and effects of nonlocal response in metallic nanostructures. In particular, we thoroughly present the nonlocal hydrodynamic model and the recently introduced generalized nonlocal optical response (GNOR) model. The influence of nonlocal response on plasmonic excitations is studied in key metallic geometries, such as spheres and dimers, and we derive new consequences due to the GNOR model. Finally, we propose several trajectories for future work on nonlocal response, including experimental setups that may unveil further effects of nonlocal response.

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